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Route To:

Subject: Looper-caused Mixed Conifer Damages, Sacramento Ranger District

To: Forest Supervisor, Lincoln National Forest

On Wednesday, May 22, 2006, Terry Rogers, Forest Entomologist, of our staff, examined several areas of mixed conifer damage with Kathy Wallace, Silviculturist, and Jenny Allen, Forestry Technician, Sacramento Ranger District, Lincoln National Forest. Kathy and Jenny believed this damage was being caused by the New Mexico fir looper, *Galenara consimilis*, a member of the moth family Geometridae. Two mixed conifer sites were examined in James Canyon (Sleepygrass 1 and 2), located near the Daly Resler Boy Scout Camp, one site at Cathey Vista, and one site along Forest Service Road 64. The results of our ground examinations verified that the damages occurring to the mixed conifer stands in James Canyon and at Cathey Vista and along FS Road 64 were caused by inchworms or loopers belonging to the family Geometridae. Douglas-fir, white fir and white pine were observed to be affected.

A few of the larvae were collected and brought back to our office in Albuquerque where it was determined that while they were indeed geometrids, they were not of a species seen in the Sacramento Mountains in the last several years.

Figure 1. *Nepytia janetae* life stages collected as late instar larvae near Cloudcroft, NM and reared. Photos by Cliff Ferris (adults) and Dan Ryerson (larva and pupae).

The timing of the defoliation was also inconsistent with the life cycle of the New Mexico fir looper, which overwinters as a pupa. To have done so much damage so early in the spring, we believe this insect would have to overwinter as either an egg or a larva. In pursuit its identity , we provided a rearing cage to the District staff who collected many caterpillars, reared them on Douglas-fir foliage and then sent the resulting pupae to us in Albuquerque. We, in turn, reared as many as possible to adulthood, the stage most useful to a taxonomist. Moth specimens were submitted to Dr. Cliff Ferris, University of Wyoming Emeritus Professor, who identified them as *Nepytia janetae* (no common name) (fig.1).

Results of the field evaluation conducted by Terry Rogers are summarized below:

> Damages were heavy in all the areas examined. Many of the trees examined in James Canyon (fig. 2) and at Cathey Vista (fig.3) and along FS Road 64 showed signs of heavy to complete needle mortality. Looper-caused damages were also very heavy in Scott Able Canyon, south of FS Road 64 (fig. 4).

Figure 2. Looper damage, James Canyon.

Figure 3 Looper damage, Cathey Vista.

Figure 4. Looper damages along Scott Able Canyon, Sacramento RD.

Larval density surveys were also conducted at the four sites to provide an indication of population levels and to establish a baseline for future looper evaluations. One branch (70 cm in length) was cut from the lower mid-crown of three sample trees at the 4 sites examined. Sample trees met the following criteria: Douglas-fir or white fir; dominant or co-dominant; and measuring 30-60 feet in height. Larval densities were expressed in larvae (caterpillars) per 1000 square meters of foliage (Table 1).

Location	**Larvae per 1000 Square Meters of Foliage**
Sleepygrass 1	30
Sleepygrass 2	4
Cathey Vista	18
FS Road 64	8

Table 1. Results of larval sampling conducted May 22, 2006.

Since conifers in general do not tolerate heavy defoliation (needle loss) well, many of these heavily damaged trees are not expected to recover, especially if they are defoliated again next year. Terry revisited these sites again during the week of June 26, 2006 and found most of these damaged trees were almost completely defoliated (fig. 5.) Although these data indicate larval populations were much higher at Sleepygrass1 and Cathey Vista, damages to individual trees were similar in all areas examined.

Figure 5. Heavy defoliation caused by the looper**, *Nepytia janetae.***

Sketchmapping completed during a special aerial survey conducted on June 7, 2006 by Rick Norris of our staff showed these loopers had damaged approximately 4,360 acres of the mixed conifer forest on the Sacramento Ranger District (fig. 6).

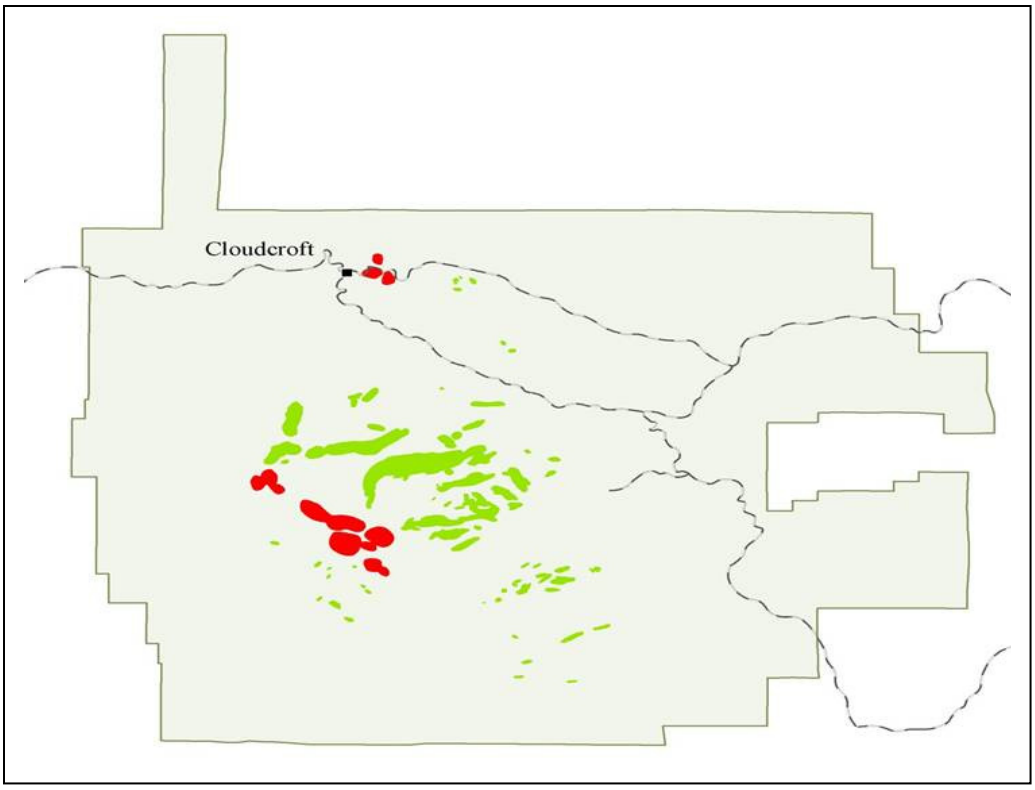

Figure 5. Red = 2006 Looper Damages (4,360 acres)
Green = Prior Years Looper Defoliation (13,610 acre)

Parasites, predators, and disease play a significant part in reducing insect populations during outbreaks. One of the factors that limited the number of adult moths we were able to rear was the high rate of fly parasitism of our samples. Heavy rains during the flight period may also reduce egg laying. Adverse weather conditions during the hatching period can greatly reduce caterpillar survival. Starvation is a factor in terminating outbreaks where severe defoliation has occurred.

We will be attending a meeting arranged by Kathy Wallace to discuss this looper outbreak and the results of our annual insect and disease aerial survey fight. If you have any questions, please contact me at (505) 842-3286, or via email at dallenreid@fs.fed.us; or you may contact Terry Rogers at (505) 842-3287, or via e-mail at trogers@fs.fed.us .

/s/ Debra Allen-Reid
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